CLAIMS:

1. A pressure-compensating mass flow controller, said mass flow controller comprising:

a control valve;

a flow sensor; and

a pressure sensor positioned upstream from said control valve,

wherein said control valve is operated based on signals from said flow sensor and from said pressure sensor.

2. The pressure-compensating mass flow controller of claim 1, wherein said flow sensor is positioned upstream from said control valve.

3. The pressure-compensating mass flow controller of claim 2, wherein said pressure sensor is positioned upstream of said flow sensor.

4. The pressure-compensating mass flow controller of claim 1, wherein said mass flow controller further comprises a filter.

5. The pressure-compensating mass flow controller of claim 4, wherein said filter is positioned upstream of said pressure sensor, said flow sensor and said control valve.

6. The pressure-compensating mass flow controller of claim 1, wherein said flow sensor is a thermal flow sensor.

7. The pressure-compensating mass flow controller of claim 1, wherein said mass flow controller comprises a display, said display displaying data based on said signal from said pressure sensor.

8. A process fluid control assembly comprising

a pressure-compensating mass flow controller in accordance with claim 1; and

a first pneumatic valve positioned upstream of said pressure-compensating mass flow controller, said first pneumatic valve being adapted to control the flow of a fluid through the process fluid control assembly in response to a first pneumatic signal.

9. The process fluid control assembly of claim 8, comprising a manual shutoff valve upstream of said pressure-compensating mass flow controller.

10. The process fluid control assembly of claim 8, wherein said first pneumatic valve comprises a handle adapted for manual shutoff.

11. The process fluid control assembly of claim 8, wherein said first pneumatic valve comprises an actuator and a handle, wherein said actuator is adapted to move the valve, in response to a pneumatic signal, from a closed state into an open state, and wherein said handle is adapted to move said valve from said open state into said closed state regardless of whether a pneumatic signal is present.

12. The process fluid control assembly of claim 8, comprising a second pneumatic valve upstream of said pressure-compensating mass flow controller and a third pneumatic valve downstream of said pressure-compensating mass flow controller, said second and third pneumatic valves being adapted to control the flow of a fluid through the process fluid control assembly in response to second and third pneumatic signals.

13. The process fluid control assembly of claim 8, wherein said assembly does not comprise a pressure regulator.

14. A fluid control panel, comprising:

a substrate; and

a plurality of process fluid control assemblies in accordance with claim 8 disposed on said substrate.

15. A combination manual/pneumatic valve for a fluid control assembly, the valve comprising:

a housing;

a valve chamber disposed in said housing, said valve chamber having a fluid inlet and a fluid outlet;

a pneumatically driven actuator adapted to move the valve, in response to a pneumatic signal, between a first state in which the flow of fluid between the fluid inlet and the fluid outlet is stopped, and a second state in which flow of fluid between the fluid inlet and the fluid outlet is permitted; and

a handle adapted to move said valve from the second state into the first state, regardless of whether a pneumatic signal is present at the actuator.

16. The valve of claim 15, wherein said handle is movable between a first position and a second position, and wherein said actuator is adapted to move said valve from the first state to the second state only when the handle is not in the second position.

17. The valve of claim 15, further comprising a diaphragm and a valve seat, and wherein the diaphragm is pressed against the valve seat when the valve is in said first state, thereby preventing the flow of fluid between the fluid inlet and fluid outlet.

18. The valve of claim 17, further comprising an expansion chamber having a piston therein which is adapted to press the diaphragm against the valve seat when no pneumatic signal is present at said actuator.

19. The valve of claim 18, wherein said housing is equipped with an air inlet adapted to receive a pneumatic signal, and an air outlet adapted to bring said expansion chamber to atmospheric pressure when said air outlet is brought into open communication with said expansion chamber.

20. The valve of claim 19, wherein said handle is movable between a first position and a second position, and wherein the piston is adapted such that the presence of a

pneumatic signal withdraws the piston from the diaphragm only when the handle is not in the second position.

21. The valve of claim 20, wherein said air outlet is in open communication with said expansion chamber when the handle is in said second position.

22. The valve of claim 21, wherein said piston allows the diaphragm to move from a position in which it is pressed against the valve seat, to a different position, by advancing along a longitudinal axis in a first direction in response to a pneumatic signal.

23. The valve of claim 17, further comprising a spring adapted to maintain a compressive force on said diaphragm.

24. The valve of claim 15, wherein said handle is equipped with a threaded cylinder that rotatingly engages a complementarily threaded aperture in said housing.

25. The valve of claim 24, wherein said housing is equipped with an inlet adapted to introduce pressurized air into said expansion chamber, and an outlet adapted to exhaust said expansion chamber.

26. The valve of claim 25, wherein said handle has a shaft that is equipped with a passageway defined by first and second apertures that are in open communication with each other, and wherein said first aperture is in open communication with said expansion chamber.

27. The valve of claim 26, wherein said second aperture is adjustable, by rotation of said handle, from a first position in which it is in open communication with said inlet, to a second position in which it is in open communication with said outlet.